Mono- versus Di- nuclear Pt(II)
6-(5-Trifluoromethyl-Pyrazol-3-yl)-2,2’-Bipyridine Complexes: Synthesis, Characterization and Remarkable Difference in Luminescent Properties

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Figure S1. The emission spectra of 3a in CH₂Cl₂ at room temperature. The emission spectra at two different concentrations are normalized at 580 nm.

Figure S2. The emission spectra of 3a in CH₂Cl₂ at 77 K. The emission spectra at two different concentrations are normalized at 620 nm.
Figure S3. The excitation spectra of 4b in CH$_2$Cl$_2$ monitored at 510 and 650 nm, respectively.

Figure S4. (a) and (b) show the P$_1$ and P$_2$ emission decay of 4b at 298K, 203K, and IRF, respectively. Note that the identical relaxation dynamics for P$_1$ and P$_2$ bands at different temperatures lead to the establishment of excited-state equilibrium (see text for detail).
**Figure S5.** The frontier orbitals of complex 5b associated with significant bimetallic interaction to confirm the $^3$LMMCT transition in the low-lying excited states. (The singly occupied molecular orbital (SOMO) for the triplet electronic state is similar to the LUMO of ground state; while SOMO-1 is like HOMO.)
Figure S6. The frontier orbitals of complex 3b and 4b associated with significant bimetallic interaction to confirm the $^3\text{LMMCT}$ transition. (The singly occupied molecular orbital (SOMO) for the triplet electronic state is similar to the LUMO of ground state; while SOMO-1 is like HOMO.)
Figure S7. Potential energy surface scan of the $S_0$ states for complexes 3b and 4b versus the Pt···Pt distance. The geometries of the $S_0$ states were performed with the restricted-TPSS method at each Pt-Pt distance. Note that in each scan, except for the fixed Pt···Pt distance, all other ligands are freely optimized.

Table S1. The respective emission lifetimes of the P$_1$ and P$_2$ bands at different temperatures of 4b.

<table>
<thead>
<tr>
<th>Temperature (K)</th>
<th>203</th>
<th>233</th>
<th>263</th>
<th>298</th>
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<tbody>
<tr>
<td>P$_1$ band lifetime (ns)</td>
<td>351</td>
<td>341</td>
<td>314</td>
<td>284</td>
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<tr>
<td>P$_2$ band lifetime (ns)</td>
<td>359</td>
<td>333</td>
<td>306</td>
<td>290</td>
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